

# Plastics Play Key Role In Supersonic Aircraft

The same "magic" plastics that rushed modern living to post-war homes are playing key roles in the production of four modern-day fighters through ingenious adaptations of the materials to a wide range of airplane parts at the Torrance facility of North American Aviation, Inc.

Known technically as acrylics, phenolics and fiberglass, the materials are familiar to most housewives as their clear plastic containers, decorative plastic sink tops and textured fiberglass drapes.

Tomorrow, they may play an equally important role in the inter-continental flight of guided missiles.

Pioneers in this highly specialized field, North American turned to plastics during World War II to meet weight and cost demands for light, strong materials. Today, the F-86 Sabre Jet of the Korean war, the F-86D fighter-interceptor for continental defense and the F-86K for NATO defense and the F-100 Super Sabre all depend to some degree on plastic parts.

**Building Leased**  
At the same time, a similar development has progressed in

the field of metal honeycomb, a structure, which the name implies, that combines lightness with bulk.

To manufacture both the plastics and honeycomb parts, North American in 1948 leased the 150,000 square foot building at 2321 Abalone Ave. in Torrance. Employment has grown steadily to its present level of 525 with an estimated annual payroll of more than \$2,750,000.

Responsible for the facility's operation is J. L. Barker. Cecil H. Clarke is the supervisor of plastics production, and John H. Hollingsworth the supervisor of metal honeycomb and fiberglass work.

**Precision Work in Plastics**  
Today's F-100 Super Sabre, first production airplane that is supersonic in level and climbing flight, is an example of the uses both honeycomb and plastics are being put to.

Included among the Super Sabre parts manufactured at the Torrance facility are the critical dive brake door, the trailing edges and tips of the wing and stabilizer, the canopy, heat and vent ducts, and chutes for the spent shells of its powerful 20 millimeter cannons.

Production techniques at the facility are as wide and varied as the materials themselves. Clear acrylic plastics, for instance, are molded into a pilot's canopy with the care of an op-

er working a precision lens. Special handling equipment to prevent ruinous scratches is used to move the large "glass" sheets into a unique oven where the plastic becomes rubber-like under 300 degree heat.

**Plastic Made Flexible**  
After heating, the plastic, as flexible as a piece of bread dough, is draped over an airtight frame, where a vacuum evenly sucks it into the familiar "bubble" shape where it cools and hardens. Later the plastic is trimmed and mounted in a metal frame, ready for delivery to North America's final assembly lines at Los Angeles International Airport.

Because pilot vision is critical at today's split-second, supersonic speeds, canopies are scrapped when careful inspection detects wavy or distorted view areas. To avoid this, scratches are hand rubbed by plastics specialists with wax and sapphire dust, a grit so fine it is almost indistinguishable to human touch.

The durable phenolic laminated sheet plastics are also worked or formed after heat. Instead of an oven, however, they are heated between banks of lights before being pressed into shape by special

tools. Although variations of the non-transparent material are slightly different, most phenolics become pliable under controlled temperature and pressure.

**Fiberglass Unique Product**  
Perhaps the most unique of the materials processed at the Torrance facility is fiberglass cloth which enters production as the same cloth that is delivered to drapery shops and dry-goods stores. It is ordered in various forms for different parts.

At Torrance, the cloth is unrolled and impregnated with liquid resin. Still in the form of cloth, it is cut into patterns, molded into various shapes and baked to harden. To gain thickness, several layers of cloth can be stacked and bonded together under heat.

One of the key parts formed from the cloth is the black, bullet-shaped radome nose of the F-86D all-weather fighter-interceptor. A critical element in the fighter's radar system for intercepting airplanes, the radome is made of fiberglass skins covering other fiberglass formed elements. Among other

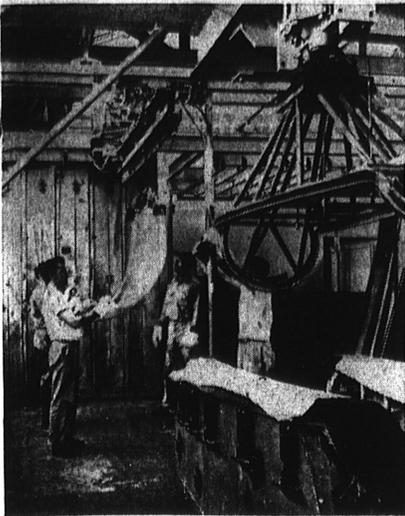
functions, these elements provide hot air channels to prevent formation of ice on the nose section.

**Cut Into Shapes**  
Porous honeycomb is stretched, cut into various shapes and then bonded to metal surfaces at the facility with special North American developed adhesives. Bonding is performed in 10 specially-constructed autoclaves, each resembling from the outside huge oval waffle irons. The auto-claves allow adhesives to be pressure-treated under jets of steam.

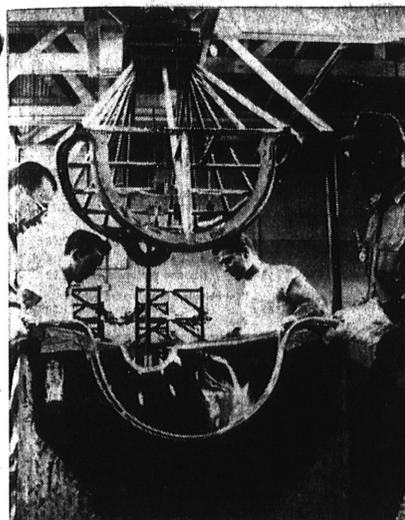
North American plastics engineers now are working on new materials that will resist greater temperatures than the current plastics and may hold the answer to damaging heat predicted in future flight.

North American's Torrance facility will be the first to know whether the new materials can be practically made into airplane or guided missile parts.

**MOOSE SIZE**  
The Alaska moose, weighing up to 1,600 pounds, is the largest of the deer family.



**THE HEAT DOES IT . . .** Rubber-like, the heated plastic is removed from the oven and carefully draped over the mold in the foreground. The four plastics specialists wear asbestos gloves to handle the material.



**JUST LIKE A BALLOON . . .** Airtight, the mold sucks the plastic into the familiar "bubble" canopy shape by vacuum. This "untouched by human hands" technique avoids damaging flaws. In the mold, the plastic will cool and harden.



**LOOK SHARP NOW . . .** Canopies are scrapped when careful inspection detects wavy or distorted view areas. Inspectors check the canopy against a checkered background in this specially lighted room. To avoid distortion, scratches are rubbed out with wax and sapphire dust, a grit so fine it is almost indistinguishable.

## Official Winners

Sweepstakes	mpg.
Studebaker Commander Custom	27.4
Based on highest non-mile per gallon.	
Class	mpg.
A Rambler Super 6	27.4
B Studebaker Com'der Custom	27.4
C Nash Ambassador Super 6	25.1
D Buick Roadmaster	19.7

Cars pictured represent best mileage of each make.

The sixth annual Mobilgas Economy Run which finished Wednesday at the foot of Pike's Peak, after covering 1323 tortuous miles from Los Angeles in 2 1/2 days, proved one thing for sure: when American car manufacturers added horsepower, they didn't sacrifice mileage.

The 21 American cars, which were equipped with automatic transmission and certified absolutely stock by American Automobile Association, averaged an impressive 21.5 miles per gallon. This was achieved even though the average horsepower increased over 1954 models was 17.6 per cent—an average increase of 26.7 horsepower.

The route chosen by AAA represented every road condition a motorist would normally experience in a year. Each contestant ran a maximum legal speed to meet time requirements. He adhered to normal driving rules and traffic conditions; to see that this was accomplished, he had at his side an official AAA observer. Each car, competing against others in its price class, was in top condition—properly fueled with Mobilgas and lubricated with Mobilol.

Again, the Mobilgas Economy Run proves the mileage performance possible when good cars, good drivers, and good petroleum products work together. A regular stop at the Flying Red Horse sign for Mobilgas helps you to obtain "par" mileage on any course you run.

# Official Results of the Mobilgas Economy Run

The Mobilgas Economy Run is a vigorously competitive, certified mileage test of American stock cars with automatic transmission. It is sponsored by General Petroleum Corporation to demonstrate the mileage and performance built into today's high horsepower automobiles.



The 1323-mile course stretched through the Indian country of the great Southwest. Topography proved as the cars spun through the desert near the New Mexico border near Flagstaff crossing the Continental Divide at the 9382-foot level.

**THINGS TO TALK ABOUT**  
BY FRANKLIN J. MEINE  
Editor, American Peoples Encyclopedia

In 1954 the largest U.S. universities (full-time enrollment) included the University of California, (35,273); New York State University, (22,849); University of Minnesota, (20,309); University of Michigan, (18,750); Ohio State University, (16,084).

CALLING ALL CARS! BAJ TEST

THE SIGNAL CORPS HAS DEVELOPED AN EXPERIMENTAL WRIST RADIO. THEY NAMED IT "BICK TRACY".

EVEN WHILE THEY ARE STILL TOO YOUNG TO USE, ARMY RESEARCHERS HAVE GUILLS LONG AND SHARP ENOUGH TO PENETRATE ENEMIES.

**FREE** Booklet describing the colorful, historic Indian country of the Great Southwest through which the Mobilgas Economy Run traces 1,323 miles of scenic and historic driving routes. Write General Petroleum, Room 501, P. O. Box 2122, Torrance, Calif., Los Angeles 55. TH 98

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